

**NON-PROVISIONAL APPLICATION FOR UNITED STATES PATENT****FOR****MOBILE COMMUNICATION DEVICE WITH USER WELLNESS VERIFICATION****Related Application**

This application is non-provisional application of provisional application 60/459,875, filed on April 1, 2003, having the same title, and claim priority to said '875 provisional application.

Said '875 provisional application is a continuation-in-part application, claiming priority to:

(a) U.S. Patent Application No. 10/087,098, filed 3/1/2002, entitled "PERSONALIZING ELECTRONIC DEVICES AND SMART COVERING", which itself claims priority to its provisional filing no. 60/306,326, on 7/17/2001; and

(b) U.S. Patent Application No. 09/932,154, filed 8/17/2001, entitled "MOBILE ELECTRONIC DEVICE AND COVERING FOR SIMILAR DEVICES WITH ORNAMENT ATTACHMENT MECHANISM", which itself claims priority to its provisional filing no. 60/292,123, on 5/17/2001.

Accordingly, the U.S. version of this application further claims priority, through the '875 provisional application, to the '098 and '154 non-provisional applications, and to their parent applications, the '326 and the '123 provisional applications, for the materials described in the respective non-provisional and provisional applications.

Additionally, the U.S. version of this application further claims priority to U.S. application number 09/908,118, filed July 17, 2001, entitled "LUMINESCENT SIGNALING DISPLAYS UTILIZING A WIRELESS MOBILE COMMUNICATION DEVICE".

### FIELD OF THE INVENTION

The present invention relates to the field of mobile communication devices. More specifically, the present invention is related to mobile communication devices, such as wireless mobile phones, personal digital assistants (PDA) and so forth, equipped with user wellness verification capabilities.

### BACKGROUND OF THE INVENTION

Advances in microprocessor and telecommunication technology have led to wide spread deployment and adoption of mobile devices, such as wireless mobile phones and PDA. For wireless mobile phones, in addition to wireless telephony, the late models are often equipped with advanced capabilities, such as calendar, address book, access to the World Wide Web (WWW), emails, and so forth. Similarly, for PDA, in addition to calendar and address book functions, the late models are often equipped with advanced capabilities, such as wireless telephony, word processing, spreadsheets, and so forth. In other words, for advanced models, there are increasing cross over or convergent of the functionalities.

Much of these functionalities are designed to increase the productivity of business users. Lately, some manufacturers have begun to include functionalities, such as games, instant/text messaging, radio, music player, and so forth, designed for the more youthful users. Few functions, if any, have been introduced for the

elder users, which in the U.S., is rapidly becoming the largest user segment, as the baby boomer generation reaching the retirement age.

Thus, it is desirable to enhance mobile communication devices with functionalities designed for the older users. In particular, it is desirable to enhance mobile communication devices with a function to verify a user's wellness under various conditions, as many of the older users are without company or otherwise unattended to often.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like references denote similar elements, and in which:

**Figure 1** illustrates a front view of a mobile communication device, more specifically, a wireless mobile phone, incorporated with the teachings of the present invention, in accordance with one embodiment;

**Figure 2** illustrates an architectural view of the wireless mobile phone of **Fig. 1**, in accordance with one embodiment;

**Figure 3** illustrates the operational flow of the relevant aspects of the user wellness verification function of **Fig. 2**, in accordance with one embodiment;

**Figure 4** illustrates an exposed view of the wireless mobile phone of **Fig. 1**, including a back view of an interchangeable cover where the teachings of the present invention are incorporated, in accordance with an alternate embodiment;

**Figures 5-6** illustrate two variants of another wireless mobile phone, incorporated with the teachings of the present invention, in accordance with two other alternate embodiments;

**Figures 7a-7c** illustrate yet another wireless mobile phone, incorporated with the teachings of the present invention, in accordance with yet another alternate embodiment; and

**Figures 8a-8d** illustrate a number of exemplary instructions to verify user wellness, in accordance with a number of embodiments.

#### DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The present invention includes a mobile communication device, in particular, in some embodiments, an interchangeable cover of the device, equipped to verify wellness of a user of the device under various conditions.

Parts of the description will be presented in terms, such as mobile communication devices, wireless mobile phones, interchangeable covers, and so forth, consistent with the manner commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art.

As well understood by those skilled in the art, the term "mobile communication device" as used herein (hereafter, simply "mobile device"), including in the claims, comprise wireless mobile phones, PDA, and other devices of the like.

The term "wireless mobile phone" as used herein (in the specification and in the claims) refers to the class of telephone devices equipped to enable a user to make and receive calls wirelessly, notwithstanding the user's movement, as long as the user is within the communication reach of a service or base station of a wireless network service provider. Unless specifically excluded, the term "wireless mobile phone" is to include the analog subclass as well as the digital subclass (of all signaling protocols).

The term "cover" as used herein refers to a part that inherently includes multiple surfaces that cover at least multiple ones of the exterior surfaces of the body or core unit of a mobile device, where the exterior surfaces are inherently disposed in different geometric planes. Accordingly, while a "cover" may come in many variants, as illustrated by the description to follow, a "card" like part, i.e. a part having the form factor of a "credit card", a PCMCIA card, a PC card, a Compact Flash card and so forth, is not a "cover", for the purpose of the present application. A "card" like part, for the purpose of the present application, by definition, is considered to occupy only one geometric plane. [PCMCIA = Personal Computer Memory Card International Association]

In the following description, various aspects of the present invention will be described. However, it will be apparent to those skilled in the art that the present invention may be practiced with only some or all aspects of the present invention. For purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that the present invention may be practiced without the specific details. In other instances, well-known features are omitted or simplified in order not to obscure the present invention.

Various operations will be described as multiple discrete steps in turn, in a manner that is most helpful in understanding the present invention, however, the order of description should not be construed as to imply that these operations are necessarily order dependent. In particular, these operations need not be performed in the order of presentation.

The phrase "in one embodiment" is used repeatedly. The phrase generally does not refer to the same embodiment, however, it may.

The terms "comprising", "having" and "including" are synonymous, unless the context dictates otherwise.

Referring now to **Figures 1-2**, wherein a front view and an internal component view of a wireless mobile phone **100**, incorporated with the teachings of the present invention, in accordance with one embodiment, is shown. As illustrated in **Fig. 2**, operating logic **230** of wireless mobile phone **100** includes in particular, a user wellness verification function **232** equipped with logic to verify the wellness of a user of phone **100** under various conditions, referred to as user wellness verification conditions, to be described more fully below. For the embodiment, phone **100** also includes an optional motion sensor **216**, such as, an accelerometer, to sense motion of phone **100** and provide the sensing results for identification of some of the user wellness conditions.

Beside novel user wellness verification function **232** and motion sensor (e.g. accelerometer) **216**, phone **100** includes conventional elements such as body casing **116**, display **108**, standard input key pad **102** having a number of conventional alphanumeric keys, "talk" and "end talk" buttons **104**, scroll button **105**, selection buttons **106**, antenna **110**, ear speaker **112**, and microphone **114**. In various embodiments, keys of key pad **102** are either surrounded by or otherwise include illuminable light emitting diodes (LED) in their background. The terms "button" and "key" are synonymous, unless the context clearly indicates otherwise.

Internally, phone **100** includes conventional elements, such as micro-controller/processor **202**, digital signal processor (DSP) **204**, non-volatile memory **206**, general purpose input/output (GPIO) interface **208**, transmit/receive (TX/RX)

**212** (also known as transceiver), and battery power (not shown) coupled to each other via bus **214** and disposed on a circuit board **220**.

Except for user wellness verification function **232**, optional motion sensor **216**, and the employment of some of the enumerated elements in novel manners to practice the present invention, the enumerated elements otherwise perform their conventional functions known in the art.

Non-volatile memory **206** is employed to store programming instructions and optionally, working data, including operating logic **230** with user wellness verification function **232**. Working data may include the designated party or parties (e.g. their phone numbers or IP addresses) to whom user wellness verification function **232** is to report, in the event the user of phone **100** fails to confirm wellness when requested. Working data may also include the constant portion of the substance of the report (e.g. the constant portion of the voice/text message). An example of a constant portion of a voice/text message is "Hello, please be advised that <user name> may not be well." As the previous sentences suggest, reporting may be in the form of a call or a text message, or other communications of like kind.

Processor **202**, assisted by DSP **204**, is employed to operate phone **100**, executing operating logic **230**, including user wellness verification function **232**. Beside user wellness verification function **232**, operating logic **230** is equipped to facilitate and track usage of phone **100**. In some embodiments, usage may include voice calls as well as text messaging. For text messaging, messages may be sent in the format of Short Messaging Service (SMS), Hypertext Transport Protocol (HTTP) or other format/protocol of the like.

Battery power (not shown) provides power for the various enumerated components, including indication of remaining power.

Motion sensor **216**, when included, may be employed to denote motion, including change in altitude.

Keys of key pad **102** may be employed to enter alphanumeric data, including entering a sequence of alphanumeric data as requested to verify a user's wellness.

Scroll key **105** and companion selection keys **106** may be employed to scroll and select various options or list items of various menu options or selection lists, including scrolling and selecting list items presented for user interactions to verify the user's wellness. For the embodiment, scroll key **105** may be selected in one of two positions, an "up" position or a "down" position for scrolling a selection list in an "up" direction and a "down" direction respectively.

GPIO **208** may be employed to generate input signals, such as a corresponding "alphanumeric" signal in response to a user selection of one of the keys of key pad **102**, a "scroll" signal" (or more specifically, a "scroll up" or a "scroll down" signals) in response to a user selection of scroll key **105**, a "selection" signal in response to a user selection of select button **106**, and so forth.

TX/RX **212** may be employed to transmit and receive signals for a call and/or a text message, including in particular, a call placed or a text message sent by user wellness verification function **232** when a user fails to confirm his/her wellness.

TX/RX **212** may support one or more of any of the known signaling protocols, including but are not limited to CDMA, TDMA, GSM, and so forth.

The constitutions of these elements are known, and will not be further described. As to user wellness verification function **232**, it may be implemented in the assembly or machine instructions of processor **202**, or a high level language that can be compiled into these assembly or machine languages.

Accordingly, except for the enhancements provided, phone **100** otherwise represents a broad range of wireless mobile phones, including both the analog as well as the digital types (of all signaling protocols), substantially rectangular uni-body as illustrated, or curved uni-body, as well as multi-portions, such as “flip phones” to be illustrated later.

Further, while the present invention will be described primarily referencing wireless mobile phone **100** of **Fig. 1**, and other alternate embodiments, referencing the remaining figures, the present invention is not so limited. The present invention may be practiced with PDA incorporated with telephony modules, or facilities, and other devices of the like. These devices are all within the anticipated scopes of the present invention.

**Figure 3** illustrates the operational flow of the relevant aspects of user wellness verification function **232**, in accordance with one embodiment. As illustrated, on start up/reset, user wellness verification function **232** (hereinafter, simply verification function) monitors for occurrence of various events within phone **100**, block **302**. On either detection of an event being reported, or periodically, between reporting of events, verification function **232** determines whether the reporting of an event, or the absence of reporting of event denotes a user verification condition, blocks **304a-304b**.

In one embodiment, the user wellness verification conditions due to the reporting of an event may include

a) battery power of phone **100**, as reported by battery power, has dropped beneath a “floor” threshold, and

b) phone **100**, as reported by motion sensor (e.g. accelerometer) **216**, has experienced a change in vertical altitude in excess of a change rate threshold (potentially, because the user fell).

In one embodiment, the user wellness verification conditions due to the absence of reporting of event may include

a) phone **100**, as indicated by the absence of motion reporting by motion sensor (e.g. accelerometer) **216**, has not been moved for a period of time, and

b) phone **100**, as indicated by the absence of usage reporting by operating logic **230**, has not been used for a period of time.

In alternate embodiments, the user wellness verification conditions may include more or less conditions.

On determining that the reporting of an event or the absence of reporting of event does not denote a user wellness verification condition, the process continues back at block **302**.

However, if the reporting of an event or the absence of reporting of event is determined to denote a user wellness verification condition, verification function **232** solicits user interactions with phone **100** to verify the user is well, block **306**.

In one embodiment, depending on the user wellness verification condition that prompted the user wellness verification, the user interaction solicited may include e.g.

a) move or use phone **100** "immediately", i.e. within a relatively short prescribed time (**Fig. 8b**),

b) charge phone **100** "immediately", i.e. within a relatively short prescribed time (**Fig. 8c**),

c) answer one or more prompts or questions (**Fig. 8a**), and

d) follow one or more instructions, e.g. touching one or more keys as instructed (**Fig. 8d**).

In one embodiment with illuminable LED underneath or surrounding input keys of key pad **102**, for interaction type (d), the keys to be touched may be illuminated successively, identifying the keys the user to touch in sequence.

In alternate embodiments, other user interactions may be solicited instead.

In one embodiment, verification function **232** alerts or otherwise attempts to get the attention of the user to verify his/her wellness, by simulating the receipt of a call, which may include causing a series of rings, vibrations, and so forth.

If the user fails to verify his/her wellness to the "satisfaction" of verification function **232**, verification function **232** reports the failure, block **310**. As described earlier, the reporting may be in the form of one or more voice calls or text messages or other communications of like kind to one or more designated parties. The designated party or parties may be a member of the user's immediate family, a member of the user's extended family (i.e. relative), a business associate, a health care provider (a nurse, a doctor or their assistant), a messaging service, and so forth. The names of the parties, the manner of reporting, and any information needed to make the reporting, e.g. phone numbers, IP addresses may be provided to phone **100** via any one of a number of known configuration means or to be designed. For examples, the information may be entered by the user, downloaded (e.g. at the time of signing up for the service, assuming the invention is offered as a service), or pre-loaded at the factory (if the function is an integrated offering of the network service provider), and so forth. Similarly, the provided information may be stored in any one of a number of known data organizations or to be designed

What constitutes "satisfactory" verification is application dependent. For example, if the verification involves having the user answer a prompt, then answering the prompt correctly may constitute "satisfactory" verification. On the other hand, if the verification involves answering a series of questions, then answering  $n$  of  $m$  questions correctly,  $n$  and  $m$  being integers, may constitute "satisfactory" verification.

If the verification involves performing a task, such as moving or using the phone, or touching a sequence of keys within  $m$  minutes, then moving or using the phone, or touching the sequence of keys within the prescribed time, may constitute "satisfactory" verification. In the case of touching a sequence of keys, the additional requirement of touching  $p$  of  $q$  keys correctly,  $p$  and  $q$  being integers, may also be included in the "satisfactory" determination.

If the user verifies his/her wellness to the "satisfaction" of verification function **232**, the process returns to block **302**, and continues from there as earlier described.

**Figure 4** illustrates an exposed view of a phone **400**, incorporated with the teachings of the present invention, in accordance with an alternate embodiment. For the embodiment, unlike the embodiment of **Fig. 1**, user wellness verification function **232**, including optional motion sensor **216**, are embedded in interchangeable cover **400a** of phone **400**. Cover **400a** is designed to mate with core unit **400b** of phone **400** covering front surface **400a** and the side surfaces **400b-400e**.

More specifically, all or portion of user wellness verification function **232** is embedded in electronic component **422**. In the case of partial embodiment of user wellness verification function **232**, electronic component **422** may include data, such as a uniform resource locator (URL), identifying one or more remote locations from

where the “remainder” of user wellness verification function **232** may be obtained. Of course, “remainder” may be the entire user wellness verification function **232**. That is, electronic component **422** includes only data such as a uniform resource locator (URL), identifying one or more remote locations from where the entire user wellness verification function **232** may be obtained.

User wellness verification function **232** (in whole or in part) or data identifying the remote location(s) where user wellness verification function **232** is located (in whole or in part), as well as output signals of motion sensor **424** may be provided to the core components within core body **400b** of phone **400** via complementary contacts **406** and **426**.

Of course, in yet other embodiments, either user wellness verification function **232** or motion sensor **216** may be disposed on an interchangeable cover, and not both.

**Figures 5-6** illustrate yet two other embodiments incorporated with the teachings of the present invention. **Figure 5** illustrates an alternate embodiment where the earlier described user wellness verification function, including optional motion sensor, are disposed inside core unit **516** of phone **500** as the embodiment of **Fig. 1**. The two embodiments differ only in that phones **100** and **400** are substantially rectangular in shapes, whereas phone **500** has a curved shape. Further, for phones **100** and **400**, input keys **102** and **402** are disposed “underneath” display **108** and **408** respectively, whereas for phone **500**, it is the opposite. That is, input keys **502** are disposed “above” display **508**.

Note that since both input keys **102/502** and displays **108/508** have their natural orientations, i.e. the manner they are designed to be read, thus the "beneath"/"above" relative disposition is objectively determined.

**Figure 6** illustrates an alternate variation of **Fig. 5**, similar to **Fig. 4** as an alternate variation of **Fig. 1**. That is, the user wellness verification function (in whole or in part) is disposed in an electronic component **622**, which along with optional motion sensor **624**, are embedded in interchangeable cover **600**. The verification function (in whole or in part) or the data identifying where the verification function may be obtained (in whole or in part), as well as the output signals of motion sensor **624** are provided to the core components of a phone against which cover **600** is attached, via contact **626** and its counterpart.

As described earlier, in yet other embodiments, either user wellness verification function **232** or motion sensor **216** may be disposed on an interchangeable cover, and not both.

**Figures 7a-7c** illustrate yet another embodiment of the present invention. More specifically, **Fig. 7a-7c** illustrate three mated views of a mobile phone **700** having a core unit and cover **710**, endowed with the teachings of the present invention. Unlike the earlier described embodiments, the core unit of mobile phone **700** has a multi-section form factor comprising a first section **704a** and a second section **704b**, and the second section **704b** is further comprised of at least two sub-sections **704c-704d**. The first and second sections **704a-704b** may pivot towards each other as denoted by direction arrow **706a** or away from each other opposite to the direction denoted by arrow **706a**. Sub-section **704c** may rotate relative to sub-section **704d** as denoted by the directions denoted by arrows **706b-706c**. In other

words, phone **700** may be considered as an improved version of what is commonly referred to as “flip” phones.

Similar to the earlier described embodiments, the core unit of mobile phone **700** includes in particular, display **708**, a number of input keys **702**, and an expansion interface (covered by cover **710**), and internal components similar to those of **Fig. 2**. As described earlier, section **704b** of phone **700** with which cover **710** is to mate, includes a front and a number of side and end exteriors surfaces, disposed in different geometric planes.

Cover **710** is of a type similar to cover **600** of **Fig. 6**, i.e. U-shaped, except electronic components **722-724** and contact **726** are disposed on the inside surface of the “back” surface of cover **710**. As before, upon mating with sub-section **704c** of phone **700**, cover **710** covers at least partially a front surface and one of the side and end surfaces of sub-section **704c**.

As described earlier, in yet other embodiments, either user wellness verification function **232** or motion sensor **216** may be disposed on an interchangeable cover, and not both.

### Conclusion and Epilogue

Thus, it can be seen from the above descriptions, a novel mobile device equipped with a function to verify wellness of a user of the device under various conditions has been described.

While the present invention has been described in terms of the foregoing embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments described. The present invention can be practiced with modification and alteration within the spirit and scope of the appended claims. Thus,

the description is to be regarded as illustrative instead of restrictive on the present invention.